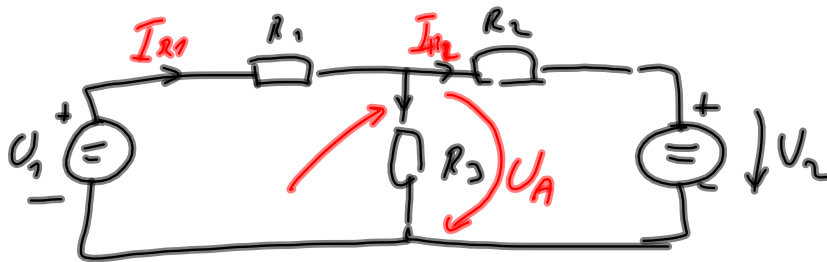
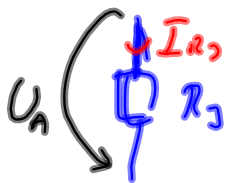


IEle 2016 27.10.2016

15°



$$\underline{I_{R1}} = \underline{I_{R2}} + \underline{I_{R3}}$$



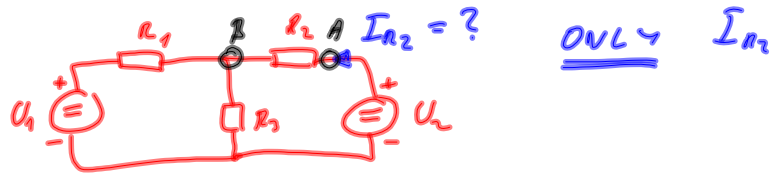
$$I_{R3} = \frac{U_A}{R_3}$$

$$\frac{U_1 - U_A}{R_1} = \frac{U_A - U_2}{R_2} + \frac{U_A}{R_3}$$

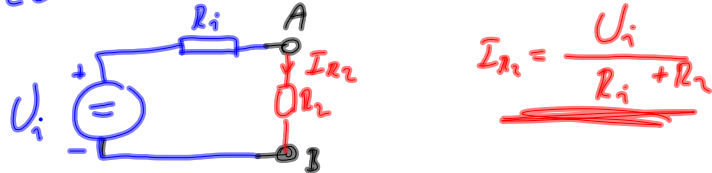
R_1, R_2, R_3, U_1, U_2 ← CONSTANTS

$$U_A \dots \text{UNKNOWN} \Rightarrow \underline{\underline{U_A = ?}}$$

THEVENIN THEOREM



EQUIVALENT CIRCUIT :



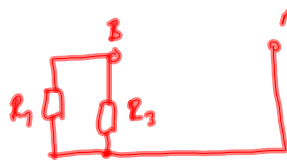
$$I_{R2} = \frac{U_i}{R_i + R_2}$$

R_i : OUR STARTING CIRCUIT WITHOUT R_2

VOLTAGE SOURCES ARE REPLACED BY ZERO RESISTOR

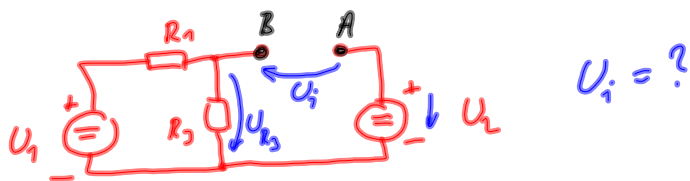


$$R_i = R_{AB}$$



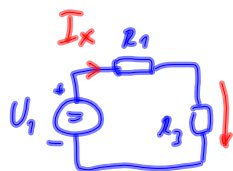
$$R_{AB} = \frac{R_1 \cdot R_3}{R_1 + R_3}$$

U_i : AGAIN WITHOUT R_2



$$U_i + U_{R3} - U_2 = 0$$

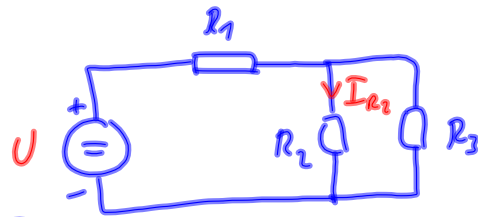
$$U_i = U_2 - U_{R3}$$



$$I_x = \frac{U_1}{R_1 + R_3}$$

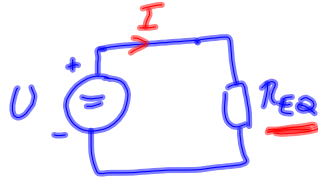
$$U_{R3} = R_3 \cdot I_x$$

$$U_i = U_2 - U_{R3}$$



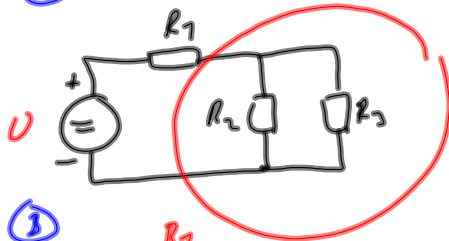
(1) USING SIMPLIFICATION METHOD

!!!

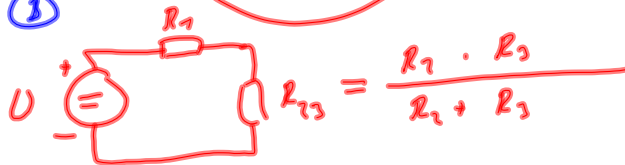


$$I = \frac{U}{R_{eq}}$$

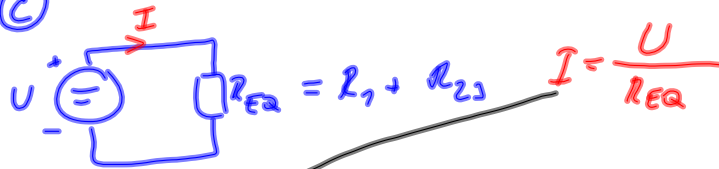
(A)



(B)



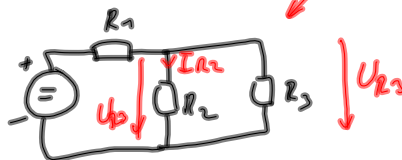
(C)



(D) = (B)



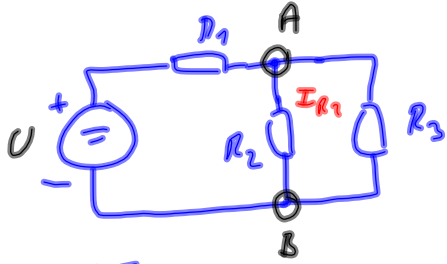
(E) = (A)



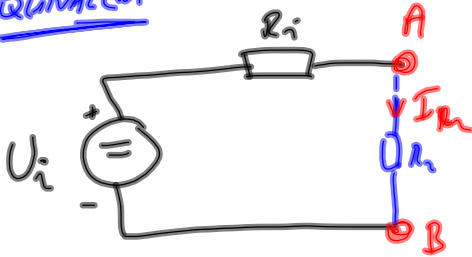
$$I_{R2} = \frac{U_{R2}}{R2}$$

(2)

I_{R_2} BY THEVENIN THEOREM



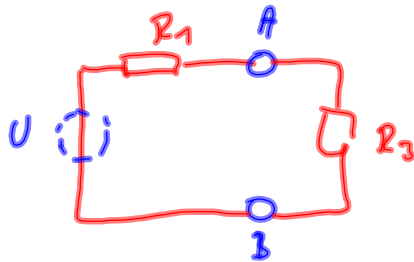
EQUIVALENT



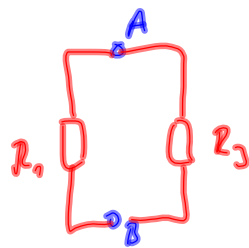
$$I_{R_2} = \frac{U_i}{R_i + R_2}$$

R_i :

WITHOUT R_2 , VOLTAGE SOURCE $\equiv \emptyset \Omega$

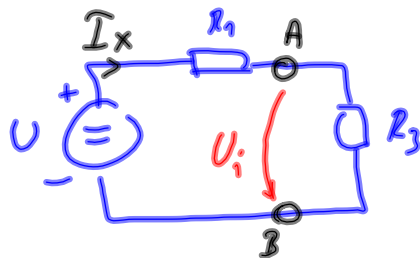


$$R_i \equiv R_{AB}$$



$$R_i = \frac{R_2 \cdot R_3}{R_2 + R_3}$$

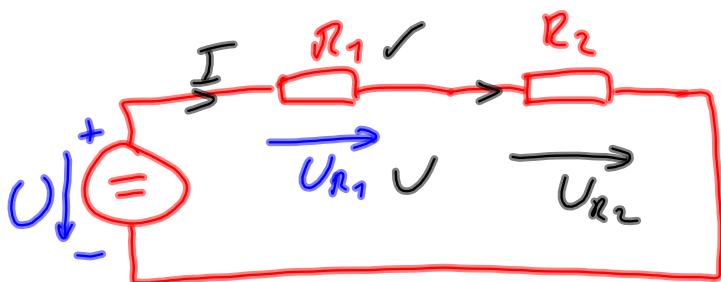
U_i



WITHOUT R_2

$$I_x = \frac{U}{R_1 + R_3}$$

$$U_i = U_{R_3} = \underline{R_3 \cdot I_x}$$



$$\underline{\underline{R_2 = ?}}$$

$$R_1 = 100 \Omega$$

$$U_{R_1} = 100 \text{ V}$$

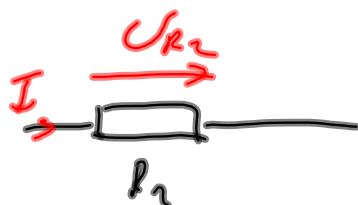
$$U = 200 \text{ V}$$

$$U_{R_1}, R_1 \Rightarrow$$

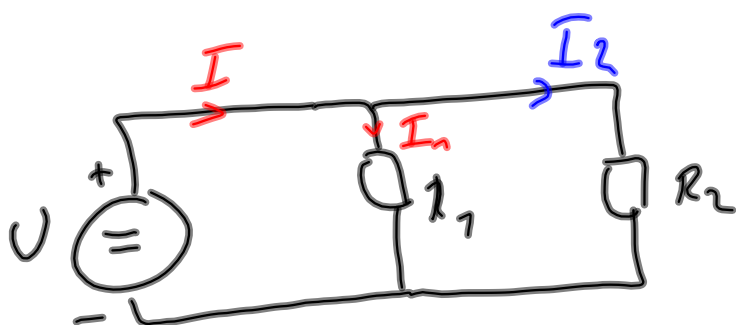
$$\underline{\underline{I = \frac{U_{R_1}}{R_1}}}$$

$$\underline{\underline{U_{R_1} + U_{R_2} - U = 0}}$$

$$U_{R_2} = U - U_{R_1}$$



$$R_2 = \frac{U_{R_2}}{I}$$



$$R_2 = ?$$

$$I = I_1 + I_2$$

$$R_1 = 300 \Omega$$

$$I = 3 A$$

$$I_1 = 0.5 A$$

$$I_2 = I - I_1$$

$$U_{R_1} = I_1 \cdot R_1 \Rightarrow$$

$$\underline{U_{R_2} = U_{R_1}}$$

$$R_2 = \frac{U_{R_2}}{I_2}$$

